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OCTOBER 29, 1949

SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE

Blanketing the Past

See Page 283

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AGRICULTURE

Cows Feed Selves In Automatic Barn

➤ AN ultra-modern barn designed as a self-service cafeteria for wintering cattle was announced by Rutgers University, New Brunswick, N. J. This novel solution to the problem of winter feeding is adaptable to both small and large farms.

Designed for maximum cow-convenience and minimum man-labor, the self-feeding arrangement permits the cows to satisfy their hunger at will just as they do in summer pasture. The cows feed through specially designed gates with dividers that safeguard the animals against strangulation.

A winter's supply of hay is stored vertically in huge bins that run the length of the barn. The cows feed from the bottom and the weight of the hay keeps a constant supply at the feeding point.

Its designers believe the new feeder to be a major labor saver. They point out that last winter it took only four man-hours to feed 70 tons of dry hay to 44 beef steers.

The "automatic barn" is one product of farm mechanization experiments conducted by the New Jersey Experiment Station at Fiddler's Creek Farm near Lambertville. Paul M. Mazur, New York banker and owner of the farm, endowed the project and has cooperated with University scientists on it. Some of their other developments, still largely in the experimental stage, are a self-feeding silo, and machines and methods for harvesting and handling hay.

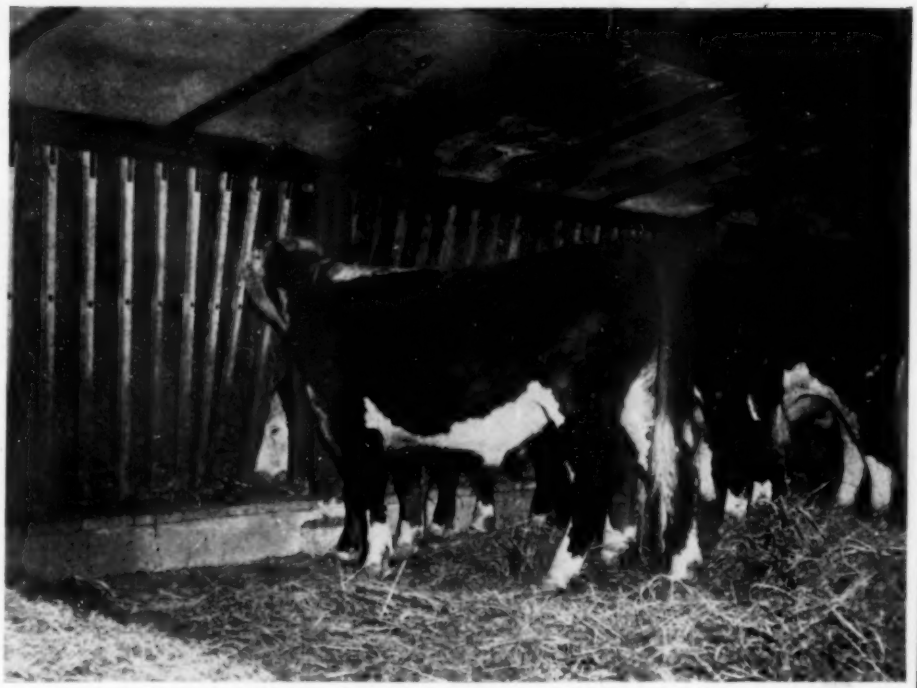
The Fiddler's Creek barn, designs and devices of which are available free of charge for non-commercial use, is described as "a quonset within a quonset." The inner building is the barn proper, where the animals feed themselves and are housed. Over this shed stands another larger structure. The space between the sidewalls of the two semicircular "quonsets" forms the bin where the hay is stored. The hay is blown in through an air hose, direct from the hay wagon into the top of the storage bin.

Another innovation is an air-blowing system through the stored hay, which permits the hay to be dried in the barn rather than in the field where hay-making is at the mercy of the weather.

In the automatic barn and the self-feeding silo, which is being tested this winter, Mr. Mazur and his colleagues foresee the possibility of increased mechanization, even on very small farms.

Science News Letter, October 29, 1949

Joint research by the National Bureau of Standards and the Civil Aeronautics Administration has developed a *coating for fabric-covered aircraft* that about doubles the time between ignition of the fabric and its destruction by fire.



SELF-FEEDER FOR CATTLE—Farm labor and costs are greatly reduced by permitting cattle to feed themselves through specially designed gates.

MEDICINE

Chemicals Aid Leukemia

Anti-folic acid chemicals bring temporary improvement in leukemia. Two other chemicals, nitrogen mustard and urethane, give relief in tumor ills.

➤ CHEMICAL treatment of more than 200 persons suffering from cancer-like acute leukemia has brought about significant temporary improvement in from 11% to 50% of the cases.

Other forms of cancer have also been temporarily aided by the same chemicals, which are known to be antagonistic to the folic acid vitamin.

Dr. Carl V. Moore of the Washington Universtiy School of Medicine, St. Louis, reported these encouraging results to the meeting of the American College of Surgeons in Chicago.

Dr. Moore has himself treated 17 patients with significant temporary improvement in six. Other doctors have treated 203 patients with the anti-folic acid chemicals, with remissions ranging from 11% to 50%.

One of Dr. Moore's patients, a four-year-old boy, has been practically well, or as the doctor put it, "in fairly complete remission," for a year.

The chemicals used are aminopterin, amethopterin, and Amino-An-Fol.

Children apparently are helped more than grown-ups by these anti-folic acid chemicals, Dr. Moore said his and other doctors' work suggests. He emphasized, however, that the chemicals do not cure and that they cause severe toxic reactions. Painful inflammations and ulcers of the mouth, diarrhea and hemorrhage from stomach and intestines are among the toxic reactions caused by these chemicals.

Nitrogen mustard, the war gas chemical, often brings striking temporary improvement in Hodgkin's disease, and another chemical, urethane, has been helping patients with a bone marrow tumor, called multiple myeloma.

"It is obvious that the goal of destroying tumor cells without irreparably damaging normal tissues has not been attained." Dr. Moore declared.

"It is equally evident, however, that many of these substances are now of practical clinical value as palliative (relieving but not curing) agents in the management of patients with neoplastic (tumor) diseases, and that results are good enough to suggest that the ultimate goal of this type of chemotherapy may yet be achieved."

The "most important single practical development" in chemical treatment of cancer, he declared, probably is the use of female sex hormones in the treatment of cancer of the prostate gland.

Science News Letter, October 29, 1949

MEDICINE

Surgery on Beating Heart

Surgical repair of defects in the heart will be aided by the development of an artificial half-heart, which will take over the functions of the right side.

➤ AN artificial half-heart, announced to the American College of Surgeons in Chicago, will give surgeons a better chance to cut open the heart itself for surgical repair of defects.

In order to operate on the "open heart," it is necessary to have some means of keeping blood circulating through the body and also of continuing to get oxygen into the blood.

To meet this problem, William H. Sewell, Jr., and Dr. William W. L. Glenn of Yale University School of Medicine devised the artificial half-heart.

A pump takes over the functions of the entire right side of the heart. This is the side to which blood that has circulated through the body is returned by the veins. Before going into the left heart, to be pumped back through the arteries to the rest of the body, this blood from the veins is pumped through the lungs. There it picks up vital oxygen.

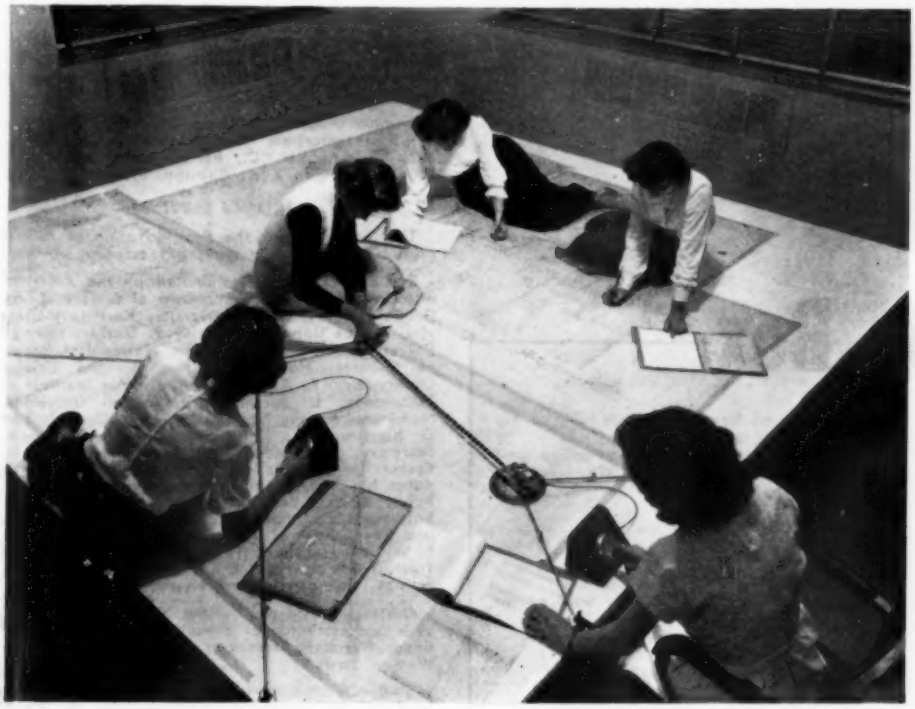
To use the new device, the surgeon cuts into the jugular vein on one side of the neck. A tube of polyethylene plastic is inserted through this vein into the big vein which brings blood back from the head, neck, arms and chest. The same polyethylene tube is run down this big vein into and through the right side of the heart and into the big vein that delivers blood from the trunk and legs.

Holes are made in the part of the tube that will lie in the two big veins but the part that is in the heart has no opening. All the blood being returned to the heart by the veins can be drawn through this double-holed tube into the artificial half-heart, or pump. By changing the pressure in the glass cylinder around the pump from negative to positive, the blood is driven through another tube into the artery leading to one lung. From there on it follows its normal course, picking up oxygen and returning to the left side of the heart to be pumped back into the body.

The artificial half-heart was used on two dogs for one hour and for one hour and three-quarters, respectively. Both dogs recovered completely and are alive now, several months after the experience. In a third dog, the heart stopped because of a technical error with the artificial respiration machine.

Blood pressure did not change after the artificial half-heart was in operation. When it had been in operation for an hour or more there was sometimes a fall in blood pressure and a decrease in blood flow.

Science News Letter, October 29, 1949



SEARCH FOR OIL-BEARING ROCKS—These women are plotting information gotten by magnetic surveys which will help Gulf geologists decide if a given area has prospects of being an oil producer.

MEDICINE

Plastic Balls Substitute For Heart Valves

➤ HOLLOW lucite balls can be used as substitutes for valves in the heart and at the entrance of the main artery, or aorta, to the heart, Dr. Charles A. Hufnagel of Harvard Medical School told the American College of Surgeons in Chicago.

The lucite valves have functioned well for prolonged periods of time in the aorta of dogs, without causing blood clots and without eroding. These substitute valves have been inserted into the hearts and aorta of 20 animals with no deaths due to failure of the valve or to the operation of inserting it. One dog has even gone safely through pregnancy and delivery of her young.

Development of the lucite valves followed earlier work in which methyl methacrylate plastic was used to replace successfully and permanently parts of the aorta in the chest.

Science News Letter, October 29, 1949

ENGINEERING

Predict New Energy Sources At Laboratory Dedication

➤ HUMANITY will be faced with catastrophe within a period of a few centuries through exhaustion of our fossil fuels, oil and coal, unless science can come forth with fundamentally new discoveries, Dr. Paul D. Foote, Gulf Oil research director and vice-president, declared at the dedication of the Leovy Geophysics Laboratory, at Harmarville, near Pittsburgh.

These new discoveries will be made if research is adequately supported, Dr. Foote declared. Any moratorium on science and technology would be fatal to economic security, he said, and "the only opportunity for continually improving our standard of living is the most intensive development of science and technology." He predicted discoveries in the production and utilization of energy surpassing anything we know today.

Named for Frank Adair Leovy, Gulf Oil Corporation pioneer in scientific oil exploration who died in June, the new laboratory is the world's largest building devoted to research on oil prospecting.

Four producing oil wells are struck by geophysical methods to every one found by unscientific oil prospecting.

Over half of the new building's 126 modern rooms are devoted to interpreting prospecting data from more than 500 pros-

pecting parties in all parts of the world, many of them air-borne. Aerial prospecting crews using a Gulf-developed magnetometer survey hundreds of miles of territory a day.

Science News Letter, October 29, 1949

MEDICINE

Active Despite One Lung

➤ A 21-YEAR-old girl who had one lung removed when she was a child is now a champion gymnast.

A 19-year-old boy, also with only one lung, is doing construction work at 4,000 to 5,000 feet above sea level. At this altitude the low oxygen of the air makes many a two-lunged person puff and pant on a short walk.

These two young persons were cited at the American College of Surgeons meeting in Chicago as examples of the outcome of removing an entire lung in a child. They are among 22 children who underwent this operation at Barnes Hospital, St. Louis. Studies of the present condition of the survivors were reported by Drs. R. M. Peters, A. Roos, H. Black, T. H. Burford and E. A. Graham

Of the 22, five died immediately after the operation. One lived eight years but died in an accident. Two are too young for satisfactory evaluation and four cannot be located. One has extensive disease in the remaining lung, which makes physiologic evaluation valueless.

The remaining nine include six girls and three boys. Their ages at the time of lung removal ranged from three to 14 years. Conditions for which the lung was removed were bronchiectasis, lung abscess, a granuloma, or tumor, of unknown cause, and the chronic infection actinomycosis.

These nine young people are all now leading a normal life, some having been operated on as long ago as 13 years. None has any significant curvature of the spine or other cosmetic deformity.

"One of the most striking and provocative findings from our studies," the doctors reported, "is that the best performance on all tests was found in the two most active patients, the gymnast and the construction worker, both of whom had made a concerted effort to overcome their handicap."

Children whose parents did the most to keep them from activity seemed to be the poorest performers.

Science News Letter, October 29, 1949

MEDICINE

Skin Burns from X-Rays Preview Atomic Exposures

➤ TREATING the common and dangerous skin burns caused by exposure to radiation gives doctors a preview on a small scale of what they will be called on to treat in the event that the atom bomb is used in another war.

These burns are at present most prevalent in doctors who use X-rays and fluoroscopes for treating patients, but this hazard is expected to decrease in this group, Dr. James Barrett Brown of Washington University School of Medicine, told the American College of Surgeons meeting in Chicago.

The burns are chronic, caused by repeated small exposures, and became progressively worse. It may take five to 25 years but cancer will eventually develop, Dr. Brown pointed out, if the burns are not removed by surgery.

If treatment is given early before the ulcerated infected stage is reached it is effective and brings immediate relief of pain. It is necessary to cut out the burns deeply so that only healthy tissue is left and then repair the area with skin grafts.

Dr. Brown said that this type of burn will probably be seen on a mass scale we have another war in which the atom bomb will be used. But surgeons will be able to combat the destructive power of the weapon with the knowledge they have gained in peace time.

Science News Letter, October 29, 1949

Question Box

AGRICULTURE

How is a new barn designed to permit cattle to feed themselves? p. 274.

ETHNOLOGY

What discovery points to a vanished people in the Arctic Circle? p. 283.

MEDICINE

How does a new device for aiding heart surgery function? p. 275.

What chemicals are bringing improvement to victims of leukemia and tumor diseases? p. 274.

What kinds of lives do people with a removed lung live? p. 276.

What treatment may prevent crippling and nerve damage in the future? p. 279.

METEOROLOGY

Why is a strict watch of the weather urged? p. 278.

POPULATION

What has been suggested as a way out of Britain's economic plight? p. 285.

PSYCHOLOGY

How are strikes preventable? p. 277.

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PSYCHOLOGY

Strikes Are Preventable

Psychologists have the "know-how" to diagnose causes and apply remedies to the social disease of which strikes are a symptom.

➤ *PSYCHOLOGISTS and sociologists could help industry prevent strikes like the present work stoppage in the steel and coal industries. They have the necessary "know-how" to cure friction.*

Strikes are symptoms of social sickness, just as fever is a symptom of physical disease. This is the opinion of psychologists queried by Science Service.

Modern doctors do more than give fever patients cooling baths to reduce fever. They go after the germs or other cause of the fever to get the patient well.

Social psychologists have better ways of treating social sickness than prescriptions for cooling off periods to avert strikes. They, like doctors of medicine, can diagnose the causes and apply remedies that will get the patient—in this case society itself—back on the road to health.

Strike Is Symptom of Underlying Social Ill

By DR. DORWIN CARTWRIGHT

Director, Research Center of Group Dynamics, University of Michigan.

➤ A STRIKE should be conceived as a symptom of deeper and more complex social malfunctioning. This social illness has important causes stemming from economic and political institutions as well as from the behavior of individuals and smaller groups.

It is a characteristic of symptoms that they cannot be satisfactorily eliminated by dealing with them directly. Action can and must be taken to prevent their getting out of hand; the patient's fever must be reduced. But future attacks of the disease will be certain to arise unless the underlying causes are dealt with. This means that any attempt to prevent strikes by direct repressive action could at best only produce other symptoms of the same social illness.

Social science possesses the research tools needed for analyzing the social disease created by the current strike. The federal government could well afford to sponsor a commission of scientists to analyze specifically the causes underlying these recurrent strikes. Such a commission should examine the major sources of tension from the point of view of economics, sociology, political science, and social psychology. It would, of course, be devoted to the search for facts, and the discovery of causes and effects, and would therefore, be in no sense partisan. Only through such a genuinely scientific diagnosis can an effective remedy be prescribed. Although there is no precedent for such a commission, research techniques and scientific knowledge have developed in recent years to such a level that a significant contribution to the reduction of tension in the coal and steel industries could now be made.

Science News Letter, October 29, 1949

Known Science Techniques Work in Settling Disputes

By DR. FRANCIS BRADSHAW

Consulting Psychologist, Richardson, Bellows, Henry & Co., New York City

➤ EXPERIENCE in conciliation in cases of labor strife and also marital relations and other types of friction show that four techniques are effective.

1. The disputing parties may be brought together to tell their troubles to a counsel. The counsel refrains from telling them what to do, but directs the discussion in such a way that the parties concerned think out their own course and arrive at their own agreement.

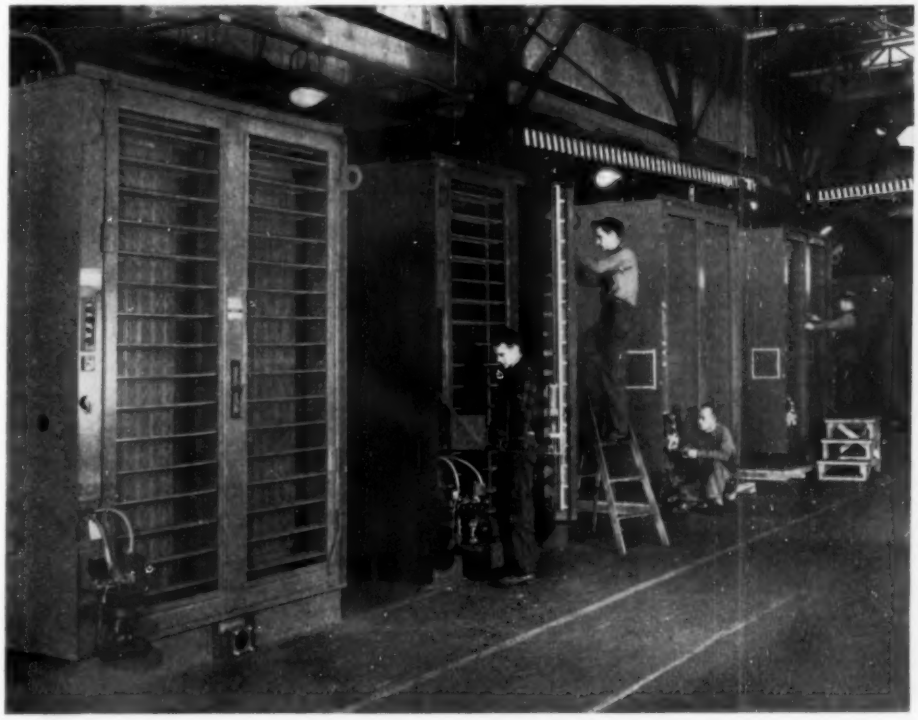
This technique, known as "non-directive counseling" has proved very effective also in the treatment of the mentally disturbed, whose conflict is internal.

The difficulty in applying this method in industrial disputes is that in order for it to work, the counsel must be invited or sought out by both parties. In an industrial dispute, one or both sides may lack any desire to arrive at a settlement.

2. The second technique is to tell the disputing parties to try this or that so that they will arrive at their own solution through experiment. This technique also works better in reconciling married partners than industrial associates.

3. The third technique is to arrange a change in the conditions which are instrumental in producing the friction. Thus a change in economic or political conditions might make it easier for industrial strife to come to peaceful solution.

4. The fourth technique is to change the attitudes of the key individuals toward themselves and toward each other. It has not been widely used because it is so difficult to achieve. It is very difficult to change



DUST VAULTS—Electronically-scrubbed air for steel mills is in the making on this assembly line at the Westinghouse Sturtevant Division plant in Hyde Park, Boston, Mass. The vault-like cubicles contain Precipitron cells, the electronic air cleaners which remove 90 percent of all air-borne dirt and dust. Each of these cubicles can clean more than 36 tons of air every hour.

an adult's way of looking at things, his notions of what he wants to get out of life, his feeling toward other men. Still it is not impossible.

Here are some of the ways attitudes can be changed.

One way to change a man's attitudes (and it is obvious in this case that somebody must change) is to search out the facts of the dispute by scientific methods.

Both sides in any industrial dispute must rely for strength in the show-down on the support of their constituencies and some of the public. Yet neither one acually knows what the men behind him really want. A scientifically conducted survey of what is wanted and needed by the stockholders, management, and the public would show each the limits of support on his side and just what he might concede without betraying his trust.

Psychological research and practical application in industry has demonstrated the value of "vertically organized" round-table discussion for producing attitude changes necessary to bring about industrial conciliation and peace.

This means bringing together not just the two top men in the dispute, but representatives of all the levels all the way down to the foreman who has direct contact with the workers and the shop steward who is the worker's adviser in dealing with management.

Such round-table discussions should be implemented with all the tools known to psychological science. Sometimes it is found that the words basic to the discussion are not understood by those involved. In one situation, tests revealed that the average supervisor failed to understand 80% of the words used in the contract under controversy. The average union's shop steward missed 70%. Attitude tests given before and after discussion show that the participants do change their attitudes as a result of frank discussion in such a round table.

What is needed to prevent strikes is the determination by management to use systematically what is known to science. They must realize that human nature is as real and important in their business as are dollars invested or machines and materials. They should pay as much attention and spend as much money on research in human and personnel relations as they do on product research.

Tension and hostility must be located and reduced before it piles up like static charges to produce an explosion and uncontrollable catastrophe.

Science News Letter, October 29, 1949

METEOROLOGY

Watch Smog Weather

➤ A STRICT watch of the weather is the chief of 10 U. S. Public Health Service recommendations for preventing future smog catastrophes such as hit the small industrial town of Donora, Pa., a year ago this month (Oct. 27, 1948).

If forecasts show a possibility of weather inversion, industrial plants should either be shut down or cut down their operations enough to reduce "sharply" the amount of contamination going out into the air.

A weather inversion, such as lasted five days in Donora last October, occurs when a layer of warm air settles over the ground air, preventing the usual updrafts.

The other nine Public Health Service recommendations have to do with reducing the gaseous and solid particle contamination of the air from both industrial plants and home heating plants, steam locomotives and steamboats. The recommendations come from an 11-month exhaustive study of the Donora situation. They presumably apply to other areas where a combination of air contamination and weather inversion produces smog.

Besides the 20 deaths at Donora last year, almost half the town's population were made sick by the smog, the Public Health Service scientists found.

With the Donora study giving "positive scientific proof" that contaminated air in industrial areas can cause serious acute disabling illness, the Public Health Service plans an expanded program for fighting air pollution.

The possibility of the mind being affected, in terms of reduced alertness and efficiency, from living in constantly polluted air, is one of the serious questions the Donora study has raised, Dr. Leonard A. Scheele, Surgeon General of the U. S. Public Health Service, pointed out.

A preliminary report of the study was given by H. H. Schrenk, Harry Heimann, George D. Clayton and W. M. Gafafer of the Public Health Service and Harry Wexler of the U. S. Weather Bureau.

Science News Letter, October 29, 1949

BOTANY-CHEMISTRY

Fertilizing, Fumigation Done in Single Operation

➤ A SINGLE spraying operation that kills plant pests and supplies plant foods at the same time was suggested to chrysanthemum growers.

At the flower show sponsored by the New York Botanical Garden and the National Chrysanthemum Society in New York, Dr. P. P. Pirone told of the recent development of a method of spraying plant nutrients directly onto the foliage instead of adding them to the soil. That was the old-fashioned way," said Dr. Pirone, a member of the Botanical Garden staff.

Although spray feeding is "still largely in the experimental stage" four or five applications weekly produce "vigorous, deep green foliage."

The newest insecticide for chrysanthemums, Dr. Pirone said, is the highly poisonous preparation called Parathion. It is almost totally effective against insects in one or two applications. Because it is dangerous to handle, he warned users to follow directions "to the letter" both indoors and out. By mixing Parathion, or the fungus-killer Fermate, with liquid fertilizer, "pest control and better foliage growth are achieved in one operation," Dr. Pirone pointed out.

For destroying the foliar nematode, a microscopic worm which blights chrysanthemum leaves, a solution of sodium selenate is applied to the soil. Because sodium selenate too is highly poisonous, Dr. Pirone cautioned against planting food crops in treated soil. Food grown on such soil will absorb some of the poison rendering it unfit for human consumption, he said.

Science News Letter, October 29, 1949

ENGINEERING

Coal Mine Safety Aided by Preventing Electric Arcs

➤ A FORWARD step in safety in coal mining comes from recent developments to prevent electric arcs or sparks jumping from power lines or car tracks to the tubing that brings air to the compressed-air blasting device now used in many mines.

Such arcs or sparks may cause explosions and fires in a coal-dust laden atmosphere. Details of two recent developments have just been released in a report of the U. S Bureau of Mines which is available free from the publications section of the Bureau at Pittsburgh. It is entitled TWO DEVICES TO PREVENT ELECTRIC ARCS WITH AIRDOX OPERATIONS IN COAL MINES.

Airdox is a system of blasting out coal faces with compressed air instead of the usual explosives. Giving no spark, it creates no fire hazard. It is now in wide usage particularly in Indiana and Illinois coal fields. The breaking of the coal comes from the sudden release of the compressed air within an ordinary drill hole in the coal.

With the Airdox, compressed air is brought to the working area by steel pipes, and copper tubing carries it from a control valve to the Airdox shell at the coal face. The first safety device is a steel-reinforced rubber-jacketed tubing 50 feet long to replace the copper tubing. The second safety device is a coupling consisting of two small steel blocks with insulated bushings installed between the copper tubing and the steel line. Similar couplings are placed at 1,000-foot intervals in the air line. These will aid in preventing sparks at the face.

Science News Letter, October 29, 1949

MEDICINE

Averting Polio Damage

There is some hope that nerve injury and crippling will be prevented in the future by treating polio victims with blood plasma and its albumin fraction.

➤ HOPE that infantile paralysis patients may be helped to escape nerve damage and crippling by treatment with blood plasma or its albumin fraction appears in research by Drs. Robert M. Eaton and Albert G. Bower at Los Angeles General Hospital.

The hope is based on three points: 1. The amount of albumin in the blood of infantile paralysis patients was often found to be lower than normal. The more severe the disease, the lower the amount of albumin.

2. Albumin is known to be important for keeping the fluid part of blood from leaking through blood vessel walls into the tissues.

3. Such leakage and accumulation of fluid, known medically as edema and familiar to the layman as dropsy, would be especially likely to injure the spinal cord. Even a small accumulation of fluid could cause damaging pressure because the spinal cord is encased in hard bone. Destruction of nerve cells in the spinal cord is what causes the crippling and paralysis in infantile paralysis. Preliminary results in treatment of 76 patients are in accord with this theory, Drs. Eaton and Bower report in the journal, SCIENCE (Oct. 21).

"Generous amounts" of plasma, from one to two pints daily, are needed in this treatment, they state.

Blood plasma has been given polio patients in the past, they point out. But this was done with the idea of giving the patients the immune, or anti-polio, substances in the globulin fraction of the plasma, somewhat as immune serum globulin is now used to ward off or reduce the severity of measles. Their theory is that the albumin of blood, with its anti-edema action, is the part that will be helpful.

Science News Letter, October 29, 1949

ENTOMOLOGY

Giant Snails Repelled

➤ THE Giant African snail has not yet invaded the United States, quarantine officials say. The notorious plant destroyer has made several dockside beach-heads, but on each occasion it has been repulsed by the vigilant authorities.

In scattered instances the snails are kept for scientific purposes, but they have attracted the most attention recently when they were discovered at east and west coast ports in cargoes of surplus war material from the Pacific. Fifteen such snail-infested shipments have been discovered. In all cases a chemical fumigant or live steam was used to kill them.

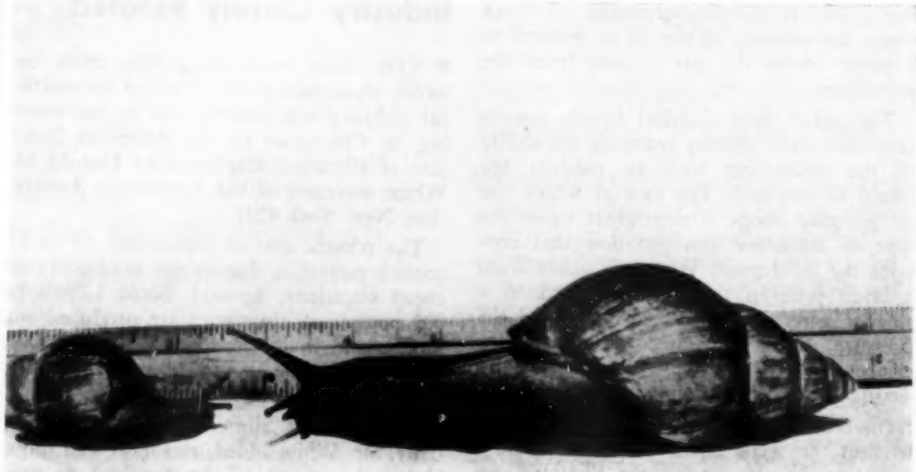
Publicity given to these unwanted stowaways has caused worried farmers and gardeners throughout the country to write to Washington, claiming that giant snails are eating up their vegetables and flowers. In every case investigated so far the offender turns out to be a local snail that has been there all the time. In no case has the giant African snail been found at large.

The efforts of the Bureau of Entomology and Quarantine to repel the giant snail have been completely successful, despite the fact that they have no legal power to quarantine snails. Quarantine laws are clear and unequivocal when it comes to insect pests, but no mention is made of the mollusks, the phylum to which snails belong. Congress had before it a bill introduced by Rep. Wingate H. Lucas (D., Tex.) that would remedy this omission, but it was not enacted in the rush of adjournment.

The snail that has given the most trouble in this country is a European variety that was introduced into California in the 1850's. Hundreds of thousands of dollars are spent every year to wipe out this pest which feeds on the choicest garden crops. In localized areas in Florida and Texas snails have caused damage, but on the whole the 800 or so native types and the 50 imported types have never reached serious pest proportions.

The Giant African snail, which started in the sub-tropics of its native Africa, has been carried steadily eastward through India, Ceylon, East Indies, the Marianas, and finally Hawaii. It is thought that the Japanese introduced them throughout the Pacific Islands as a food source for their soldiers. When the Japs departed, the snails rapidly multiplied to the point where they have become a serious menace to island agriculture. (See *SNL*, July 17, 1948, p. 44).

Science News Letter, October 29, 1949



***NO ADMITTANCE**—Quarantine officials are on the look-out for these stowaway giant snails and let them know in no uncertain terms that they are unwanted. So far none have succeeded in invading the U. S. for when discovered in ship cargoes they have been destroyed.*

Modern *farm machinery* is little used in Egypt because of cheap labor and small farms.

Fish gigging, with a pronged spear, is said to be about 10 times as efficient as the hook and line method; that is why the gig is unpopular with hook-and-line sportsmen.

PSYCHOLOGY

Concentration Important For Success in Biology

➤ SUCCESS in biological science depends more on ability to concentrate personal forces than on sheer intellectual capacity, Dr. Anne Roe, of New York City, discovered in a clinical psychological study of 20 of the country's most eminent research biologists. All of the biologists, she stated, are active in research and all but three are members of the National Academy of Sciences or the American Philosophical Society.

These men of science are either disinterested in other persons or ill at ease with them. Their sex development is retarded. They are not inclined to fight, but they are stubborn.

Many are suffering from deep-seated anxieties and many have had painful experiences in childhood. Research has proved to be emotionally satisfying and relieving to them. The educational and occupational level of their parents was generally superior and at least one parent has valued education as good in itself. Dr. Roe reported her findings to the American Psychological Association at Denver, Colo.

Science News Letter, October 29, 1949

AGRICULTURE

Fertilizer Output Hits World Record, FAO Says

➤ WORLD production of commercial fertilizer of more than 11,500,000 tons sets an all-time record high, the Food and Agriculture Organization of the United Nations reported.

These figures, which exclude Russia, compare sharply with the 1938 total of 9,000,000 tons. The increase represents the sustained high levels of fertilizer production achieved in the Western Hemisphere plus the recovery of war-damaged areas to pre-war levels and higher.

Essential to the efficient agriculture needed to feed an increasing world population, commercial fertilizer is required in even larger quantities. Although the rate of production continues to increase, the FAO foresees that demand will continue to exceed supply for some time to come.

Science News Letter, October 29, 1949

BIOCHEMISTRY

Basic Cellulose Particles Of Plants Discovered

➤ DISCOVERY of the real elementary particles of cellulose, one of the basic substances of all plants, including wood, cotton, etc., was revealed in a paper by Dr. The Svedburg, Swedish chemist, upon the occasion of the award of the famous Franklin Medal, highest honor of the Franklin Institute in Philadelphia.

Consisting of equal-sized rods of small size, visible by means of the electron microscope but far beyond the reach of the ordinary microscope, these cellulose particles or molecules seem to be the same whether they are in wood closely bound to lignin or in the fine hairs on cotton seeds. Dr. Svedberg's communication, sent from Sweden, explained that these and other giant molecules can be sorted out in the ultracentrifuge, a research upon which he has spent nearly half a century and which has brought him world recognition.

The way in which the cellulose in plants is formed is different than the way other big molecules are synthesized in non-living matter. This may give useful hints toward understanding living processes.

Science News Letter, October 29, 1949

ENGINEERING

Gas Escape Reduces Oil Flow to Output Wells

➤ IT IS gas released from petroleum deep underground that reduces or prevents the flow of the crude oil through the oil-bearing rock into the well bore which leads to the surface of the ground, according to Dr. Donald L. Katz, professor of chemical engineering at the University of Michigan.

This belief was recently discussed by him at a San Antonio, Texas, meeting of the American Institute of Mining and Metallurgical Engineers. Rapid decrease in the fluid output of some oil wells may now be explained, he said. The low production is mainly due to phenomena occurring when the pressure of the oil is reduced to a point where the gas escapes from the petroleum.

The gas is then absorbed by the porous sandstone rock, thereby reducing the ability of the oil-bearing rock to conduct the liquid to the well. The rate at which the oil pressure drops is dependent upon the type of sandstone configuration that contains the oil deposit. When oil passes from a large pore in the sandstone bed to a smaller pore, the velocity increases and the pressure drops, he stated. The gas then escapes.

When oil wells gradually stop pouring forth crude oil the only solution has been to shut the wells down until the pressure increases. In this period the liberated gas is reabsorbed by the liquid and the crude oil can then flow quite freely. With a clearer understanding of the activity occurring when oil pressure is reduced, petroleum engineers can now work more effectively to prevent the slowing down of production.

The conclusions of Dr. Katz are based on investigations conducted to study the permeability of sandstone samples when oil at different pressures was passed through the material.

Science News Letter, October 29, 1949

IN SCIENC

MEDICINE

Rapid Thawing Found Best for Frostbite

➤ FAST thawing gives best results in treatment of frostbite. Experiments showing this, which is contrary to previously held views, were reported by Drs. Joseph C. Finneran and Harris B. Shumacker of Indiana University Medical Center at the meeting of the American College of Surgeons in Chicago.

The "ideal temperature" for the rapid thawing is one slightly above body temperature, they found. Too much heat is bad, they cautioned.

The rapid thawing is effective in part at least, the experiments suggested, because it shortens the period during which tissues are frozen and temporarily bloodless.

Anti-blood clotting drugs and measures for dilating the blood vessels gave variable results but seemed generally beneficial, especially when combined with rapid thawing.

Science News Letter, October 29, 1949

ENGINEERING

Aluminum and Electric Industry Closely Related

➤ THE close relationship that exists between aluminum production and the electrical industry was pointed out at the meeting in Cincinnati of the American Institute of Electrical Engineers by Donald M. White, secretary of the Aluminum Association, New York City.

The present cost of aluminum, 15 to 17 cents a pound, is due to the availability of cheap electricity, he said. Some 1,250,000,000 pounds of aluminum are produced annually, and in its production some 12,500,000,000 kilowatt hours of electricity are used.

New uses of aluminum are developing daily, Mr. White added, and more and more electrical energy will be required to produce it. Aluminum now has more than 4,000 applications.

History and growth of the aluminum industry have closely paralleled those of the electrical industry. Electrical progress has brought cheaper electric power; cheaper power has meant cheaper aluminum; and cheaper aluminum has led to new uses and mounting demands for the metal.

Electric energy is an essential ingredient of aluminum, Mr. White stated, and represents some 20% of its total cost.

Science News Letter, October 29, 1949

NCE FIELDS

MEDICINE

Polio Cases Expected To Be High Next Year

➤ NEXT year will be another big infantile paralysis year. There may be more big years to follow.

"The end is not in sight" to the upward trend in this disease, Surgeon General Leonard A. Scheele of the U. S. Public Health Service declared at a conference of health officers in Atlanta, Ga.

He predicted that there will be between 40,000 and 45,000 cases by the end of this year, making 1949 "the most devastating year in the history of the disease."

The "marked upward trend" of the disease has been continuing since 1943. Before that there was a period of about 10 years when the number of polio cases was "moderate."

"New knowledge is urgently needed so that steps can be taken to control poliomyelitis," Dr. Scheele declared.

Whether the virus of the disease is spread through the air, or in food or by flies are questions to which answers are now being sought by scientists at the U. S. Public Health Service's Communicable Disease Center.

A definite relation between deaths of infants from diarrhea and the degree of fly control in the community has been found, he reported.

"If fly control can be attained under certain conditions," he said, "from one-third to one-half of all the intestinal dysentery can be prevented."

Science News Letter, October 29, 1949

METEOROLOGY

Better Weather Forecasts By New German Methods

➤ IMPROVED wind and weather forecasts may result from weather analysis methods developed in Germany during and since the war, H. Dean Parry of the U. S. Weather Bureau said.

The German technique consists, in part, of dividing the upper air for analysis purposes into four equal layers up to a height of 72,000 feet. Usual practice divides the air into four unequal layers to a height of 53,000 feet. The equally thick layers in the German method, Mr. Parry said, "result in a building block arrangement making it more convenient for the meteorologist to integrate the surface and upper air charts into a single unified picture."

Another difference, Mr. Parry noted, is that the German air charts give a better picture of air movements over areas where data are sparse, such as over oceans. The German technique could result, he said, "in more accurate wind forecasts for aircraft over oceanic areas or in an improvement in particular cases of the forecast of general weather conditions."

Mr. Parry spoke before the District of Columbia branch of the American Meteorological Society. He has recently returned from a three-year assignment in Germany where he was chief of the Meteorological Branch of the Office of Military Government.

In addition to these methods of analyzing and charting the weather data, a "teachable procedure" for applying these data to "tomorrow's weather map" has also been developed, Mr. Parry said.

Science News Letter, October 29, 1949

VETERINARY MEDICINE

Canned Reducing Diet Is Available for Dogs

➤ IF your dog is too fat for his health, you can now buy a special canned reducing diet on veterinarian's prescription.

And when Suzette is going to have puppies, she can have a diet scientifically designed for her best nourishment while she is expecting. The same diet may be given the pups when they are born.

These diets, together with one for mature dogs and dogs with kidney disease, and another for dogs with intestinal diseases have been developed by Dr. M. L. Morris, a practicing veterinarian and specialist in animal nutrition, of New Brunswick, N. J.

Science News Letter, October 29, 1949

ENGINEERING

Photo Copying Device Makes Print of Book Page

➤ A TIME-SAVING tool to serve in scholarly research by making hand-copying from library books unnecessary was revealed by Yale University. It is a compact photographic copying device, usable by anyone and small enough to fit into a briefcase.

This device, developed by Frederic G. Ludwig, Yale Library photographer, is dubbed the "Contoura" because it can snap a contact photo of a book page even where the paper curves into the binding. It produces reversed negative prints, but these can be read by a built-in mirror or positives can be made from them.

The apparatus is in a light metal case but has a bottom of what Mr. Ludwig calls a light equalization mask and a translucent inflated cushion. The equalization mask, he says, is the secret of the Contoura's compactness. Without it, the lights within the device, six electric bulbs, could not be brought so close to the subject matter being copied. The cushion can be inflated and deflated as needed.

Science News Letter, October 29, 1949

MEDICINE

Crystalline-Like Form of Skin Tumors Discovered

➤ CRYSTALLINE-like clusters of particles, arranged somewhat like plant virus particles, have been discovered in wart-like tumors of human skin, four Yale University medical scientists reported at the meeting of the Electron Microscope Society of America in New Haven, Conn.

The skin tumors they studied are called papillomas.

The common wart and normal skin, when prepared for electron microscope study, showed no uniform particles but instead seemed to be merely shapeless, scattered clumps of matter, collagen fibers and spherical particles of varying diameter.

Characteristic brick-shaped particles, called elementary bodies, were seen in preparations from another skin ailment, *molluscum contagiosum*, which is caused by a virus.

The scientists reporting these studies are Drs. Joseph L. Melnick, Maurice J. Strauss, Henry Bunting and Ernest Shaw.

Science News Letter, October 29, 1949

AERONAUTICS

Fewer Runways at Airports New Federal Policy

➤ ONLY one runway in the future will be built with federal financial aid at Class I (Personal) airports, the Civil Aeronautics Administration has announced. These are small airports designed to serve small planes and with landing strips less than a half-mile in length.

The new policy applies to construction or improvement in both new and existing airports in this classification. In addition, the new policy states that on all other classes of airports the construction of an additional runway or runways will be approved only for the purpose of handling traffic volume, and that runways on which Federal funds are expended will be non-intersecting with any existing runway and must be either parallel or diverging.

In making the announcement of the new policy, D. W. Rentzel, CAA administrator, pointed out that single-runway airports can be located closer in to the communities to be served and with less cost of construction. In addition, traffic patterns are simplified and safety increased.

The CAA has encouraged single-strip airports ever since the Federal Aid program went into effect. This federal office, which administers the aid program, has now gone one step forward from mere "encouragement." Deviations from the new policy will be permitted only when approved by the Washington office, after being justified by exceptional conditions other than wind coverage.

Science News Letter, October 29, 1949

ASTRONOMY

Orion Appears in East

Other stars of the first magnitude can be seen in the west. Planets Venus and Jupiter are brighter than any stars in the evening sky but they set very early.

By JAMES STOKLEY

➤ WITH the beginning of winter less than two months away, the brilliant constellation of Orion, the warrior, now comes into easy view in the evening skies. Our maps, which depict the heavens as they appear about 10 p.m. at the first of November, an hour earlier at the middle of the month, and 8 p.m. at the end, show this figure in the east. The three stars in a vertical row mark Orion's belt; Betelgeuse, to the left, is in one shoulder, and Rigel, to the right, indicates one of his feet. As he rises, Orion is on his back, though by the time he stands high in the south we see him in a more dignified position.

Just above Orion is Taurus, the bull, with first magnitude Aldebaran in the animal's eye. To the left of Taurus, we see Auriga, the charioteer, with bright Capella. Below this figure stand Gemini, the twins, with Castor and Pollux (the brighter of the pair) as the most conspicuous stars.

For other stars of the first magnitude, we must look toward the western half of the sky. Standing vertically in the northwest is the "northern cross," actually part of Cygnus, the swan. Below it and a little to the right is Lyra, the lyre, with the star Vega, while Altair, in Aquila, the eagle, stands to the left. And low in the southwest we find Fomalhaut, in Piscis Austrinus, the southern fish. Some other fishes may be seen still higher, the constellation of Pisces, below and to the left of the "great square" of Pegasus, the winged horse.

Planets Outshine Stars

The two planets visible these November evenings are brighter than any of the stars mentioned. These are Venus and Jupiter, but they set so early that the former fails to get on our map at all, while the latter barely makes it, being shown just above the horizon in the southwest. In this position its brightness is greatly dimmed.

Ever since last April, when it was practically behind the sun, Venus has been drawing to the east of that body, and on Nov. 20 is at its farthest distance. Usually, this would mean that Venus is seen high in the western evening sky, long after sunset. However, it happens now that the path along which the sun and planets move is very low in the southern sky. Therefore, even though Venus, on the 20th, is 47 degrees from the sun, it merely means that it is farther to the south, and not as much higher as one might expect it to be. However, at sunset, Venus is about 20 degrees above the southern horizon, to the southwest, and of magnitude minus 4.

At sunset, Jupiter, which is somewhat fainter, of magnitude minus 1.7, is almost directly south, a little to the left of Venus. Both of these planets are in the constellation of Sagittarius, the archer. Venus is approaching Jupiter, and passes it Dec. 6.

Mars To Rise in East

After midnight, at the beginning of the month, the planet Mars, which has now just reached the first magnitude, rises in the east, followed after a couple of hours by Saturn. However, Mars is approaching Saturn, and passes it at a distance about a third the apparent diameter of the full moon, on Nov. 30. By this time both rise about midnight, and the two planets, of similar brilliance and so close together, with Mars to the north, will make a most striking sight.

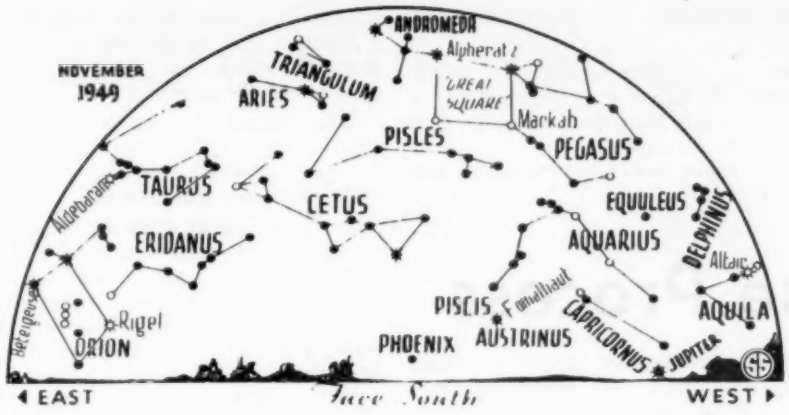
Probably, to the layman, one of the most puzzling things about astronomy is how astronomers find the distances of the stars and planets. Basically it is very simple, and makes use of methods similar to those often used by surveyors on the earth. Suppose, for example, that the surveyor wanted to measure the width of a river without actually going across it. To do this he would pick out two points on the same side and measure the distance between them, perhaps with a tape. Then he would take his transit instrument to each of these locations. With it he would measure the angle between some feature on the opposite side of the river—a tree, perhaps—and the other position. Thus he would be able to draw a triangle, its base the distance between the two observing posts. Since the angle made by this base with each of the other sides is known, only one triangle is possible, and so he could compute by trigonometry, the branch of mathematics dealing with triangles, the height of his triangle, that is, the distance across the river.

For the heavenly bodies, we need much longer baselines, which can be obtained in some cases by observing from different parts of the earth. For an astronomer in New York and another in Santiago, Chile, almost directly south, observing the moon at the same time, that body would be in slightly different directions. As seen against the background of far distant stars, the South American would observe a little farther north than his northern colleague. Thus, by measuring this shift, or parallax, as it is called, and knowing the distance between the two observatories, the distance of the moon from the earth could be found. As used by astronomers, the parallax of the moon is the difference between the directions as seen from both ends of a standard baseline equal to the radius of the earth. Since the moon's distance changes, this varies through the month.

Distance of Moon

During November, it would be at its greatest parallax, a little over a degree of arc, on the 18th. The larger the parallax, the nearer the object, so this is the date of "perigee," when the moon is nearest. Its distance is then 223,400 miles. On Nov. 3 the parallax will be 54 minutes of arc, about 10% less than one degree. This is called "apogee," when the moon is farthest, with a distance of 252,300 miles.

In angular measure there are 360 degrees in a complete circle, 60 minutes in a degree and 60 seconds in a minute. It is to seconds that we have to go in measuring the parallax of Venus, for example. On Nov. 20, when that planet is farthest east of the sun, its parallax is 13 seconds. This would be equal to a shift of one inch at a distance of about 1400 feet, rather a small amount. For the earth's radius, it corresponds to 62,955,000 miles, the distance of Venus on Nov. 20.



☼ ✱ ○ ● SYMBOLS FOR STARS IN ORDER OF BRIGHTNESS

By the time we get to the stars, the greatest distance available on the earth is much too small to produce any measurable parallax, but fortunately we have a larger baseline. If we take measurements six months apart, the earth has shifted a distance equal to twice its distance from the sun, or about 186,000,000 miles, and for the nearest of the stars this produces a small parallax. None, however, has one as large as a second.

The largest is that of a faint star in the southern constellation of Centaurus, proxima Centauri, its parallax being slightly over three-fourths of a second, equal to a distance of 25,284,000,000,000 miles. But since this is rather a large figure to handle, astronomers usually use other units for stellar distances. One is the light year—the space covered in a year by a beam of light, traveling 186,000 miles every second, some six trillion miles. Proxima Centauri's distance is 4.3 light years. At the other extreme are the most distant galaxies of stars that can be photographed with the new 200-inch telescope—about a billion light years away!

Time Table for November

Nov.	EST	
3	1:00 p. m.	Moon farthest, distance 252,300 miles
5	4:09 p. m.	Full moon
8	3:27 a. m.	Algol (variable star in Perseus) at minimum
11	12:16 a. m.	Algol (variable star in Perseus) at minimum
13	10:47 a. m.	Moon at last quarter
	9:05 p. m.	Algol at minimum
14	7:52 p. m.	Moon passes Mars
15	8:31 a. m.	Moon passes Saturn
16	early a. m.	Leonid meteors visible
	5:54 p. m.	Algol at minimum
18	9:00 p. m.	Moon nearest, distance 223,400 miles
20	2:29 a. m.	New moon
	1:00 p. m.	Venus farthest east of sun
23	2:10 p. m.	Moon passes Venus
24	7:38 a. m.	Moon passes Jupiter
27	5:01 a. m.	Moon in first quarter

Subtract one hour for CST, two hours for MST, and three for PST.

Science News Letter, October 29, 1949

ETHNOLOGY

Clue to Vanished People

See Front Cover

➤ DIGGING in the hard ice of a bleak, uninhabited island in the far north within the Arctic Circle, scientists have found a drawing made by an unknown artist some 500 years ago which shows that once a vanished people lived there. The island is Cornwallis Island in the Canadian Arctic Archipelago.

The drawing, made on a snow knife used for cutting snow blocks for building temporary snow houses, shows five men in an "umiak" a typical Eskimo boat. The men are on a whale hunt. This is made clear by the fact that one in the bow is shown in the act of throwing a harpoon into a whale. The whale is also shown. The find was made this summer by Dr. Henry B. Collins, Jr. of the Smithsonian Institution, assisted by J. P. Michea of the National Museum of Canada.

Times must have changed weather conditions because now there are no whales near the island to hunt and no men to hunt them. The scientists believe that a change has occurred in ice conditions in the past 500 years which altered the direction of ocean currents.

The currents washed a considerable amount of driftwood to the island. This is shown by finds of articles such as weapon handles and boat frames made of wood. No wood reaches Cornwallis Island in these days.

The vanished people are believed by the ethnologists to be of the "Thule culture," ancestors of some of the present-day Eski-

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mos. The Thule people made their way across Arctic Canada to Greenland during the course of several centuries.

These people who once lived on Cornwallis Island lived in small villages of ten or a dozen houses. They built permanent homes with stone walls and floors and having roof supports and beams of whale bone.

Some were evidently accomplished primitive artists. In addition to the interesting view of the whale hunt, drawings of caribou and geese were found.

Science News Letter, October 29, 1949

MINERALOGY

U. S. Manganese Process

➤ IMPROVED processes for obtaining manganese for steel-making from domestic low-grade ores give promise of freeing America from dependence upon foreign supplies, particularly from Russia.

Importations from all sources now total over 1,500,000 tons a year, and the domestic production is very small. Modern steels can not be made by known methods, except at greatly increased cost, without manganese. In prewar days, the principal source of manganese for American steel-makers was Russia. Now large quantities are obtained from India and Africa.

A process for recovering manganese from low-grade ores by leaching with waste pickle liquor, which is produced in large volume in certain steel manufacturing operations, was revealed recently by Richard D. Hoak, Mellon Institute, and James Coull of the University of Pittsburgh. A high-grade manganese concentrate can be recovered from the leach liquor.

The ore is ground to a fine size, then treated with the waste pickle liquor, the mixture being agitated. Some 95% of the manganese is extracted in a 15-minute period. After filtration, the filtrate is treated with calcium chloride. Calcium sulfate is filtered off. The filtrate from this operation is treated with pulverized high-calcium limestone to separate the iron in it. After the hydrated iron oxide is filtered off, the filtrate is treated with high-calcium lime to precipitate the manganese. The result is hydrated manganese oxide.

The oxide ores of manganese are by far the most important commercially, Messrs. Hoak and Coull stated. The materials now used in steel-making are largely ferromanganese, spiegeleisen and silicomanganese. The action in steel-making is both as a deoxidant and as an alloying element. As an alloying element, manganese imparts desirable physical properties to a wide range of commercial steels.

A great deal of research has been devoted to the development of processes for utilizing low-grade manganese ores. America has an abundant supply. Dependence on imported high-grade ore from distant parts of the world in times of great emergencies is highly hazardous. Manganese is rated in the United States as a strategic metal. Manganese ore-dressing methods constitute a major project of the U. S. Bureau of Mines.

Science News Letter, October 29, 1949

MEDICINE

Dramamine Relieves Migraine and Nausea

➤ DRAMAMINE, the new drug that both prevents and relieves seasickness, may help patients with migraine headaches and mental patients with nausea after electric shock treatments.

This possibility appears in satisfactory results with the drug for both conditions reported by Dr. Edward F. Kerman of Baltimore to the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION (Oct. 15), in Chicago, Ill.

The migraine-relieving effect was discovered accidentally. The father of one of the patients getting electric shock treatment was a long-time migraine sufferer who usually had some nausea with his headaches. One day he decided to try for his migraine attack one of the dramamine pills given his daughter.

"He claimed that the migraine was relieved completely and rapidly," reports Dr. Kerman, who then decided to try it on eight other migraine patients.

Every one reported benefit from it. Since there were no control studies with mock dramamine pills and the number of both kinds of patients is small, Dr. Kerman says his report is "preliminary" but that he feels other physicians should know of his experiences with the drug.

Science News Letter, October 29, 1949

PHYSICS

"Radiac" Set for Disaster Use Is Being Produced

➤ RADIATION detectors for disaster use in atom-bombed areas, where the amount of radiation would swamp a Geiger counter, are now being produced commercially for use by military and civilian defense organizations, the Department of the Army announced in Washington, D. C.

Designed specially for field use with disaster levels of radiation, and able to withstand rough shocks, the detector is a result of the atomic bomb tests in the Pacific.

The "radiac" set, standing for "radioactivity detection, identification and computation," will be used in training troops to survey areas and compute radiation dangers that would be left after atomic bomb blasts.

The instrument, covered with a steel case, is only 10.5 inches long and weighs 10 pounds. It consists of a gas-filled chamber, known as an ionization chamber, in which are two electrodes. When carried into "hot" areas dangerous gamma rays, the most penetrating type of radiation, go through the steel cover and knock electrons from the atoms of gas in the ionization chamber, making the gas slightly conducting. A weak electric current can then flow between the electrodes to show on the radiation-indicating dial.

Science News Letter, October 29, 1949

GENERAL SCIENCE

Andrade to Head British Royal Institution

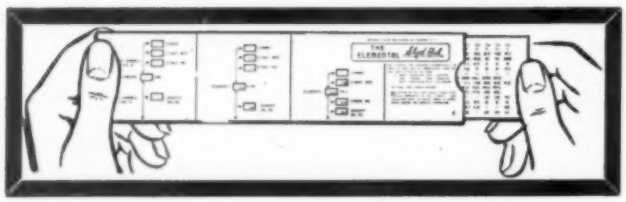
➤ PROF. E. N. da C. Andrade will become director of Britain's historic Royal Institution, and resident professor and director of the Davy Faraday Research Laboratory on Jan. 1.

Prof. Andrade succeeds Prof. E. K. Rideal who has headed the Royal Institution since 1946.

Since 1928, Prof. Andrade has been Quain Professor of Physics at the University of London. He is a specialist on metallurgy, particularly single crystals of metals.

Science News Letter, October 29, 1949

STUDENTS! A NEW DATA RULE—96 ELEMENTS



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POPULATION

Urge British Depopulation

➤ SEND 15,000,000 Englishmen to other parts of the British empire. That is suggested as Britain's way out of her economic plight.

This solution suggested by Guy Irving Burch, director of the Population Reference Bureau in Washington, would relieve that crowded island of its large surplus population which, if not exported, is "practically certain to continue Britain's chronic crisis."

Emigration of about a third of Great Britain's population would save the American people billions of dollars in capital and natural resources, Mr. Burch claims. It would also help to build up friendly nations on at least three sides of the United States in case of war.

The surplus people that Britain can not support from the combined yields of her land, industry and foreign trade, according to Mr. Burch's plan, would be moved to thinly inhabited British areas, such as Australia, Canada and parts of Africa, at the rate of 500,000 person a year.

Pointing to Ireland and contending that the heavy emigration from that country helped raise its living level from one of the lowest to one of the highest in Europe, Mr. Burch suggests that Britain do likewise.

Because Britain's reproduction rate is just about replacing losses, every person who leaves will be helping the situation. Mr. Burch also suggests that every Englishman who moves overseas will better his own chance of getting more adequate living conditions.

Great Britain has more than two and a half times as many people per square mile as Europe and more than 11 times as many as the United States. Only Japan among all the countries of the world is more crowded than the United Kingdom, Italy, Germany and India have less than half as many people per square mile of arable land, Mr. Burch's figures show.

Britain was able to increase her population from 20,000,000 to 49,000,000 during the last hundred years on the strength of her supremacy in industrialization, trade, naval force and foreign assets, in none of which she is now supreme.

The suggested mass migration would not be an easy job, Mr. Burch admits, but he contends that it would be cheaper to move a person once than to move some 1,400 pounds of food, plus other raw materials, every year to support that person if he remains in Britain.

Danger of both war and communism argue for the decentralization of British population. A crowded Britain just missed being starved into submission by submarine and air warfare during two wars and should not risk a third attack, Mr. Burch urges. Danger of communism in Britain is considered as serious as that of war, and hunger and social unrest are basic causes of communism, it is pointed out.

Science News Letter, October 29, 1949

ENGINEERING

Underground Aluminum Cables Used Successfully

➤ ALUMINUM-covered under-ground, overhead and submarine cables for the transmission of electrical power have been successfully introduced in England and Germany, the American Institute of Electrical Engineers was told at its meeting in Cincinnati by H. V. Menking of the Reynolds Metals Company, Richmond, Va. He said that investigations are being made of the possibility of using aluminum wire and cable without steel support for building wire to replace copper.

The aluminum is not suggested as a substitute for copper, but as an alternate in view of the expected increasing scarcity of the latter metal. He revealed also that transmission towers, built from aluminum and rolled or extruded shapes, are under study.

Science News Letter, October 29, 1949

METEOROLOGY

Wind Blows West Over London, Balloons Tell

➤ HIGH up over the heads of Britishers, from 10 to 20 miles aloft, the winds are from the west again, after having been from the east during the summer.

This is one of the facts about the weather that can be reached through high flying giant balloons tracked by radar and carrying miniature radio broadcasting sets that report the temperature.

The Air Ministry's Meteorological Office, in studies by Dr. F. J. Scrase reported in London, finds new confirmation of earlier theories, based on the way sound of explosions is transmitted, that the direction of the winds in the extreme upper air reverses about in April and then turns about again in the fall.

It is not as cold 20 miles up as it is at 10 miles aloft. But it is very cold at either height by surface standards: 40 degrees Fahrenheit below zero at 20 miles high and 76 degrees below at 10 miles high.

Science News Letter, October 29, 1949

Words in Science— STALACTITE-STALAGMITE

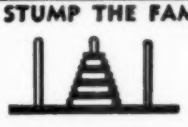
➤ THOSE beautiful fairy-like formations you see in caves are stalactites and stalagmites.

The stalactites—you say it stu-lack-tite with the stress on the lack—hang from the roof. They are lacy icicle-like formations caused by the deposit of minerals, especially calcium carbonate, from the moisture that condenses on the roof of the cave and drips down slowly.

Stalagmites — pronounced stu-lag-mites with the stress on lag—are similar formations on the floor of the cave which are built up from the drippings that fall from the stalactites overhead.

Science News Letter, October 29, 1949

STUMP THE FAMILY GENIUS



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BOTANY

NATURE RAMBLINGS

Pumpkins

➤ WHEN the first white men arrived in America, they found many things they had never seen before, including red Indians, yellow corn and orange pumpkins. Of the three the only one they treated shabbily was the first. In the lean and hungry early years of colonization, the first settlers, for preservation's sake, quickly learned to cultivate pumpkin and corn in the Indian manner.

Without benefit of county agents to tell them about strip cropping or of the agronomic virtues of crop rotation, the Indians had developed a system of planting corn in rows. Between the rows they grew pumpkins. This practice is still followed.

Pumpkins were known in the Old World. Both Europe and Asia cultivated types of garden squash. The name pumpkin itself, with which the strange squat spherical fruit was dubbed, had been applied to a type of European yellow squash long before Columbus. It is believed originally to have been a Greek word meaning "sun-warmed" or "sun-ripened," which then went through many linguistic changes to become finally the English word "pumpkin."

Pumpkins and squashes are very closely related, both being members of the gourd family. The word squash is adapted from an Indian word. Some of the more familiar types are crookneck squash, scallop or acorn squash, and Hubbard squash.

However this is all academic. Comes the fall of the year and all botanical distinctions vanish. From Hallowe'en to Thanksgiving there is but one gourd, and pumpkin is its prophet. Nothing is more American than to place a tallow candle in a hollow pumpkin on the hallowed eve. The familiar cut-out mask flickers with a benign grotesquerie. And if the pumpkin be real and not store-bought cardboard, and if mother still practices the arts her mother taught her, from the kitchen comes the incomparable fragrance of fresh-baked pumpkin pie.

Outside, the man of the house, paint brush in hand, regards his front gate with satisfaction. If the hobgoblins who last year put his gate on the garage roof try it again this year, they will get paint on their hands for their trouble. He turns and walks to the house. He sees the lighted pumpkin in the window and he smells the unmistakable aroma from the kitchen. He quickens his step, smiling to himself. And the flickering pumpkin-face seems to be smiling too.

Science News Letter, October 29, 1949

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ENGINEERING

TV Noise Is Man-Made

➤ THE "noise" that interferes with the performance of television reception is largely "man-made" and most of it can be eliminated, the American Institute of Electrical Engineers was told in Cincinnati by George D. Hulst, of Allen B. DuMont Laboratories, Passaic, N. J.

These noises come from automobile ignition, gas-filled illumination sources, motor and generator commutators, gaseous rectifiers, elevator relays and other electrical installations. These are impulse noises of short duration.

Less common is noise of long duration, including those that originate at a fixed industrial location, including automatic furnaces and refrigerators. Then there is the continuous or single frequency noise of diathermy machines, "ham" transmitters and home-made television sets. To these may be added the random or thermal noise which originates in vacuum tube apparatus, such as industrial radio frequency heating units or super-regenerative radio receivers.

The noise is not picked up entirely in the antenna, Mr. Hulst stated. It may be picked up in lead wires, the antenna post, the signal frequency circuits, the intermediate frequency amplifiers, and in some cases even by the video amplifier.

Pick-up of interfering signals can be avoided if the lead-in wire is coaxial rather than being unshielded open wires. Antenna connector posts also can be coaxial, the outer conductor being grounded to the chassis and the inner conductor having a high frequency choke connected directly to the chassis. Pick-up within the chassis can be helped considerably by the use of well-known electrostatic shielding in the receiver generally.

Much in television reception depends upon the installation man. He must orient the antenna in such a way as to minimize the noise of long duration. His installations and tests should be made when nearby factories are in operation, particularly those that use equipment that cause interference.

Science News Letter, October 29, 1949

METALLURGY

New Corrosion Protection Is Patented

➤ AN ALUMINUM-ON-STEEL combination, with the light metal or its alloys serving as a protective coating against corrosion, gives promise of wide usage with a newly patented bonding process on which the government has issued patent 2,484,118 to Richard S. Reynolds of Richmond, Va.

This new method of coating aluminum on steel makes a permanent bond, it is claimed, by use of a fine iron coating on the steel deposited electrolytically as a bonding agent. Older methods of applying aluminum to steel by dipping the steel in molten aluminum obtained an unsatisfactory bond.

In this new method, which has been assigned to the Reynolds Metals Company of Richmond, steel strip from a roll is passed in a continuous process through a cleansing bath, the electrolytic bath to receive the iron coating, a furnace to heat it to about 850 degrees Fahrenheit, then between two strips of aluminum foil between high-pressure rollers where the bonding is effected. The plated steel can then be further rolled to reduce its thickness.

Science News Letter, October 29, 1949

• Books of the Week •

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ABRAHAM LEVINSON ANNIVERSARY VOLUME: Studies in Pediatrics and Medical History—Solomon R. Kagan, Ed.—*Froben Press*, 365 p., illus., $6.00. A compilation by leading authorities of material in the fields of pediatrics, pediatric neuropsychiatry and medical history.

ADVANCES IN CARBOHYDRATE CHEMISTRY, Vol. 4—W. W. Pigman and M. L. Wolfrom, Eds.—*Academic*, 378 p., $7.80. Contributed by 14 specialists in various fields.

AIR POLLUTION IN DONORA, PA.: Epidemiology of the Unusual Smog Episode of October 1948—H. H. Schrenk and others—*Govt. Printing Office*, 173 p., illus., paper, $1.25. The information needed for preventing such an occurrence as the Donora tragedy in your community.

AMERICAN SPIDERS—Willis J. Gertsch—*Van Nostrand*, 285 p., illus., $6.95. Describing the life and habits of these interesting creatures. Beautiful photographs, many in color, add to the interest of the book.

APPLIED EXPERIMENTAL PSYCHOLOGY—Alphonse Chapanis, Wendell R. Garner, Clifford T. Morgan—*Wiley*, 434 p., illus., $4.50. A textbook with the objective of showing how machines can be more efficient by being designed to suit the psychological make-up of the human operator.

THE BOYLSTON STREET FISHWEIR II: A Study of the Geology, Palaeobotany, and Biology of a Site on Stuart Street in the Back Bay District of Boston—Elso S. Barghoorn and others—*Phillips Academy*, 133 p., illus., paper, $2.00. Intensive study of a site uncovered in the course of construction of the John Hancock Insurance Building.

CHILDBIRTH: Your Questions Answered—Carl Henry Davis and Donita Ferguson—*Harper*, 183 p., $2.50. Answers many questions which arise in the minds of mothers-to-be.

COMING OF AGE IN SAMOA—Margaret Mead—*New American Library*, 192 p., paper, 35 cents. A study of adolescence and sex in primitive societies originally published by Morrow.

EXCAVATIONS IN NORTHEASTERN MASSACHUSETTS—Ripley P. Bullen—*Phillips Academy*, 152 p., 20 pl., paper, $2.00. Report of the excavation, test and survey of Indian sites in the Shawsheen River Valley and neighboring territory.

THE FLOWER ARRANGEMENT CALENDAR 1950—Helen Van Pelt Wilson—*Barrows*, 52 p., illus., $1.00. Flower lovers will take delight in this engagement book with, for each week, a lovely photograph of a different flower arrangement.

GREEN GLORY: The Forests of the World—Richard St. Barbe Baker—*Wyn*, 253 p., illus., $3.50. A readable guide to the trees that "with the help of all plant life, controls the food supply and life of man and of the animal kingdom."

CHEMICAL ACTIVITIES OF FUNGI—Jackson W. Foster—*Academic*, 648 p., illus., $9.50. Intended to orientate a non-specialist in the field, this book is timely now that fungi are very much a part of the industrial world and have gained new importance through the discovery of antibiotics.

HOT-TINNING: Practical Instructions for Hot-Dip Tinning Fabricated Articles and Components—W. E. Hoare—*Tin Research Institute*, 112 p., illus. Free upon request to publisher, 492 West Sixth Ave., Columbus 1, Ohio. A practical manual of British origin.

IRIS FOR EVERY GARDEN—Sydney B. Mitchell—*Barrows*, 224 p., illus., $3.00. Complete directions and how-to drawings which the amateur needs. Colored photographs included.

JUST FOR TWO COOKBOOK—Lily Haxworth Wallace—*Barrows*, rev. ed., 322 p., $2.50. Intended for brides, this book includes information on how to furnish your kitchen and suggestions on what to serve.

THE MARKET FOR COLLEGE GRADUATES AND RELATED ASPECTS OF EDUCATION AND INCOME—Seymour E. Harris—*Harvard University Press*, 207 p., illus., $4.00. Discussing the problem of the college graduate's occupational outlook.

MATHEMATICS DICTIONARY—Glenn James and Robert C. James—*Van Nostrand*, rev. ed., 432 p., illus., $7.50. Contains terms, symbols, and concepts used in pure and applied mathematics, science, commerce and industry.

METALLIC CREEP AND CREEP RESISTANT ALLOYS—A. H. Sully—*Interscience*, 275 p., $5.50. Presented from the point of view of both industrial and academic worker.

METALS REFERENCE BOOK—Colin J. Smithells, Ed.—*Interscience*, 734 p., $13.50. Useful data in the form of tables and diagrams with accompanying bibliographies.

MOBILIZATION OF THE HUMAN BODY—Harvey E. Billig, Jr. and Evelyn Loewendahl—*Stanford University Press*, 65 p., illus., $2.00. A manual of physical exercises.

MOST OF THE WORLD—Ralph Linton, Ed.—*Columbia University Press*, 917 p., illus., $5.50. Articles by 14 leading social scientists on non-European lands and their main developments.

ORGANIC CHEMISTRY—G. Bryant Bachman—*McGraw-Hill*, 432 p., illus., $4.25. A text for a full year's course in organic chemistry, especially aimed at those who do not intend to become chemists.

PROGRESS IN METAL PHYSICS 1—Bruce Chalmers, Ed.—*Interscience Publishers*, 401 p., illus., $9.50. Presenting authoritative reviews in specialized aspects of the field that includes both physical metallurgy and metal physics.

RADIO TECHNOLOGY: Telegraphy, Telephony, Television, Transcription, Facsimile—Ernest J. Vogt—*Pitman*, 556 p., illus., $6.00. Something between an operator's instruction book and engineer's text, this work attempts to provide all material for FCC license examination.

RELIGION AND RACE: BARRIERS TO COLLEGE?—A. C. Ivy and Irwin Ross—*Public Affairs Committee*, 32 p., illus., paper, 20 cents. Based on impartial studies made by the American Council on Education and several state agencies.

TERRESTRIAL MAGNETISM AND ELECTRICITY—J. A. Fleming, Ed., *Dover*, 794 p., illus., $4.95. Including chapters on magnetic prospecting, radio exploration of outer atmosphere, thunder clouds and their electrical effects and many others. One of the NRC Physics of the Earth series, No. VIII.

Science News Letter, October 29, 1949

ASTRONOMY

Exploding Star Discovered—Nine Years Later

➤ AN exploding star or nova that flashed and dimmed out nearly a decade ago is the latest astronomical discovery announced to the American Association of Variable Star Observers meeting at Harvard Observatory, Cambridge, Mass.

A Dutch astronomical student, C. J. Van Houten, found the new star on a photograph taken at Leiden Observatory in April, 1940, just before Hitler invaded Holland. Nova Velorum rose to 9th magnitude and then returned to the obscurity of a very faint 16th magnitude or less. The discovery was checked on plates taken by the Harvard Observatory.

The nova is named after its location in the obscure Vela constellation (meaning the sails) which is low on the southern horizon from northern latitudes. Its position is 8 hours 55 minutes right ascension and south 52 degrees declination.

Science News Letter, October 29, 1949

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ELECTRIC LUNCH BOX, plugged into a factory or office electric outlet, provides both a steaming hot lunch and cold dessert. Besides two containers for food, it has a bottle for hot beverages. It is available also with voltage units for use in automobiles, trucks, boats and trains.

Science News Letter, October 29, 1949

OIL CAN, recently patented, is made of rubber and pressure on its sides forces the lubricant out the spout. The spout is flexible and can be bent to reach into restricted areas. A valve in the spout keeps out foreign matter when the can is idle.

Science News Letter, October 29, 1949

SOAP DISPENSER and alcohol dispenser, for use in hospitals and other places where hands must be clean and aseptic, operate automatically by an "electric eye." When a hand cuts a beam of light shining on a photoelectric cell, a squirt of the contents of the dispenser is discharged.

Science News Letter, October 29, 1949

PHOTOGRAPHIC ENLARGER for use by professionals or amateurs, shown in the picture, is a relatively efficient, economical type that uses a hollow sphere with a lamp burning inside. The white paint inside the sphere reflects and re-reflects the rays until the light is completely integrated, or evenly distributed.

Science News Letter, October 29, 1949

EGG COATING APPARATUS, for applying a coat of wax to dirty eggs in an egg-processing plant before the shells are broken, is an inclined plane down which the eggs roll while passing through a spray. The coating applied by this recently patented device prevents contamination in the egg-opening process.

Science News Letter, October 29, 1949

INSULATING SPACERS, for use in high frequency electrical applications requiring top performance, are made of the plastic polytetrafluoroethylene and are fashioned in the various forms required. Their loss factor, dielectric constant and dielectric strength do not vary with temperature change below 400 degrees Fahrenheit.

Science News Letter, October 29, 1949

IRRIGATION HOSE, to carry water to farm crops, is made of glass fiber coated with resin, and comes in 100-foot lengths from four to 16 inches in diameter. Each 100-foot length of the 10-inch size weighs 45 pounds. Each section of this flexible main line hose is equipped with a tee for the attachment of a distribution hose.

Science News Letter, October 29, 1949

Do You Know?

White light penetrates *fog* just as well as colored light.

Among the Oriental *tobacco-raising* countries, Turkey ranks first.

Sesame is one of the most promising of the new oilseed crops for America.

Well-managed forests on *watersheds* can conserve water supplies, help reduce floods, and regulate stream flow.

The great number of *roots* in a nearby river gave the city of Racine, Wisc., its name; racine means root in French.

Wisconsin has a right to the title *"Land of Lakes,"* within its boundaries are 8,289 lakes, 3,747 of which have an area of over 10 acres.

Turkey, with about 19,000,000 people and area of some 190,000,000 acres of which 73% is cultivable, has great agricultural possibilities; only 20% of its cultivable land is now in field or tree crops.

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